Foreign Direct Investment and Trade in the U.S. Food Processing Industry: Complements or Substitutes?

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A critical concern for a multinational enterprise (MNE) seeking to maximize its profits is deciding whether to emphasize production within its home country-based facilities or at its affiliates abroad. The former approach involves exporting products from the country in which the MNE is based, and the latter choice entails engaging in foreign direct investment (FDI) in facilities abroad. In this paper, we examine what determines the choice between exporting and FDI by the U.S. food processing industry. We also analyze whether trade and FDI are complements or substitutes, i.e., whether foreign affiliate sales have positive or negative impacts on exports.

Both U.S. exports and sales by foreign affiliates of MNEs have increased over the past decades. In fact, FDI growth has exceeded international trade increases recent years. To illustrate, FDI inflows and outflows as percentages of Gross Domestic Product (GDP) increased by about 64 percent and 380 percent, respectively, while trade as a percentage of GDP increased by about 18 percent between 2005 and 2013 (World Bank, 2015).

The trade-off between FDI and direct exports is of interest to policy makers, because each provides a unique set of economic activities. The U.S. food processing industry is of particular interest because with rising incomes in many nations in recent years the composition of global agricultural trade has moved increasingly toward high-value and processed food products, requiring increased levels of labor and capital, and generating intensified levels of economic activity. Because direct exports are generally associated with greater levels of economic activity in a MNE's home country than are foreign affiliate sales due to FDI, the increased levels of FDI raise concerns about shifts in general economic activity in the U.S. economy and in the U.S. labor market in particular.

In this paper, we investigate the determinants of both exports by the U.S. food processing industry and foreign affiliate sales, and compare the difference between the two. Specifically, we

examine the relationship between U.S. exports and production in a host country by U.S. multinationals in the food processing industry; we identify the relationship between foreign affiliate sales (outward FDI) and exports by determining whether FDI and trade are substitutes or complements; and we assess who stands to gain from an expansion of trade or international investments or both in terms of labor or owners of capital. Our findings have implications regarding who stands to gain from an expansion of trade or international investment or both – workers involved in domestically-located production facilities would be expected to benefit from exporting domestically-produced products, whereas the owners of capital would gain from their investments in foreign production facilities.

FDI and Trade The World Bank (2002) defines FDI as a process by which individuals or companies located in a particular country gain proprietary rights of assets with a diversity of goals, such allocating goods and services, making managerial decisions, controlling business entities abroad, gaining the power of production in another country, and transferring technological know-how. FDI can also be defined as the ownership of at least 10 percent of voting stock in a corporation by a foreign entity for the purpose of exercising control over the use of assets (UNCTAD, 2001). Foreign investment refers to investment in a foreign affiliate, where the parent company holds a large, but not necessarily a majority, of ownership interest. Parent firms are referred to as multinational enterprises, or MNEs. The investment by U.S. firms in production abroad is known as outbound FDI, while foreign firms' investment in the U.S. is known as inbound FDI (UNCTAD, 2001).

The U.S. processed food industry has traditionally had a strong global presence in both exporting and FDI. The food processing industry includes companies that transform livestock and other agricultural products into products used for intermediate or final consumption. Processed foods products are the result of a production process by which raw commodities are transformed into a processed product through use of materials, labor, equipment and technology. Any product that needs

some degree of processing is referred to as a processed product, irrespective of whether the amount of processing is minor or not. Examples include snack foods, and canned fruit.

The U.S. spends about $1 trillion on food each year (U.S. Department of Labor 2010). Federal laws give food manufacturers, distributors, and retailers the responsibility for assuring that foods are safe and are handled under sanitary conditions. A number of federal agencies, state agencies, local and international bodies play important roles in regulating food quality and safety under the law. Average annual food spending per person increased by 19 percent from 2000 to 2007 from $5,158 to $6,133. The total amount spent on food makes up about 12 percent of households' total average annual expenditures. In particular, out of the average annual per capita spending of $6,133 on food, $3,465 is spent on food at home while $2,668 is spent on food away from home (U.S. Department of Labor 2010).

Increased levels of globalization of both markets and enterprises have raised interest in possible causes of FDI in recent years. First, rapid technological change with its increasing costs and risks has motivated corporations to tap world markets in order to distribute the costs and risks involved. Second, policy liberalization has led many countries to make their investment climate less strict and more favorable to inbound FDI. Also, the decline in transportation and communication costs has made it more economical to incorporate distant operations. As a result of the rapid technological change and policy liberalization, increased competition encourages corporations to explore various ways to increase their efficiency. By reaching out to international markets, shifting certain production activities overseas, and taking advantage of economies of scale, MNEs are able to cut their marginal costs due to economies of scale (UNCTAD, 2001). These developments have led these business entities to pursue FDI strategies.

Previous Work FDI may have an impact on trade flows, which may take on either a positive or negative effect. If the relationship between FDI outflows from the home nation and exports from the host nation is positive, then FDI and exports are complements, and if it is negative, then the relationship represents

a substitution effect. FDI and trade may result into substitutes if FDI takes over trade in a host country. From the perspective of firms entering into foreign markets, FDI and exports may be viewed as competing plans. Firms have the choice to either export the product to the country or to invest and produce the product in the country. Either choice suggest that FDI and exports can therefore be referred to as substitutes (Ning and Reed, 1995). On the other hand, FDI and trade are complements if FDI generates additional trade between the countries.

Our study aims to extend previous studies on the discussion on the determinants of FDI and trade in the U.S. food processing industry, based on the framework outlined by Gopinath et al. (1999). Various methodologies have been used to analyze the underlying causes of FDI and trade. While the resulting evidence has at times been contradictory and even controversial, such differences in the empirical results not only reflect differences in data or modelling techniques, but also indicate that the determinants of FDI and trade flows are complex and multifaceted.

The relationship between FDI and trade has long been a subject of debate, and previous studies have provided inconclusive evidence on the connection. Various methodologies have been used to analyze the underlying relationship between FDI and trade and the resulting evidence if often contradictory. Gopinath et al. (1999) suggest that FDI and trade are substitutes, suggesting MNEs may choose between exporting to a country and building a plant in that country. Other authors suggest that FDI and trade could be viewed as complements (e.g., Banerjee, 1997). Both FDI and trade have the potential to create employment and increase income levels and thus enhance economic growth. This relationship has implications for who stands to gain from an expansion of trade or international investment or both in terms of labor or owners of capital in the U.S. food processing industry.

Data and Methods Our work follows and extends previous studies by Barrell and Pain (1996), Gopinath et al. (1999), and Lipsey (1994), who focused on exports and foreign affiliate sales, such that FDI is an

input for foreign production. Our analysis is based on panel data of 10 high-income countries between 1982 and 2012. The reason for focusing on these nations is that developed countries account for most U.S. direct investment abroad in the food processing industry and also because of data availability.

Our statistical model includes nine variables. In addition to FDI and sales by foreign majority-owned affiliates, we created a wage index for affiliate production in the host country by utilizing employment and total compensation of employees. We further used U.S. interest rates to represent the opportunity cost for U.S. producers investing abroad. The nominal exchange rate (foreign currency per U.S. dollar) was included to capture the effects of broad economic policies on both investment and exports, including inflation and other distortionary policies of the host country. We further derived an aggregate export price index as a share-weighted average of all prices of processed foods exported by the U.S. to the various countries. Also, Producer Support Estimate (PSEs) were included as an approximation for effective levels of protection for the food industries in the various countries. Gross National Product (GNP) per capita was included to measure the size of the market in each country. In addition, we included net taxed products to measure the extent of government regulations in the countries analyzed. Finally, we included a dummy variable for the years between 2008 and 2010 to capture the effect of the financial crisis.

Empirical Approach Consistent with Gopinath et al. (1999), we explore factors that drive sales and employment by foreign majority-owned foreign affiliates, quantities of exports and FDI. We employ four econometric models with the aforementioned variables as dependent variables, as follows:

(1) *FDI = f (XPRICE, WAGES, INT, GNP, PSE, SALES, EXRATE, TAX, DUMCRISIS)*

(2) *SALES = f (XPRICE, WAGES, INT, GNP, PSE, EXRATE, TAX, DUMCRISIS).*

(3) *XQUANT = f (XPRICE, WAGES, INT, GNP, PSE, EXRATE, TAX, DUMCRISIS)*

(4) *EMPLOY = f (XPRICE, WAGES, INT, GNP, PSE, SALES, EXRATE, TAX, DUMCRISIS),*

We employ two panel econometric procedures – panel unit root tests and panel regression. Each procedure measures a specific aspect of the interaction between *FDI, SALES BY FOREIGN AFFILIATES, EXPORT* and *AFFILIATE EMPLOYMENT.* When performing time series analysis, it is important to verify the order of integration for each of the variables to minimizes the chance of obtaining a spurious regression. The time series element of the panel dataset necessitates the need to perform unit root tests. Following Sadorsky (2010), *FDI* is the variable of interest. Thus, the AR(1) autoregressive model with one lag is:

(5) $$FDI_{i,t} = \rho_i FDI_{i,t-1} + \quad z_{i,t}\,\gamma + \mu_{i,t}, \;\; i = 1, \dots, N, t = 1, \dots, T,$$

where ρ_i is the lagged term's coefficient, $z_{i,t}$ is the deterministic component accounting for the time trend, t and any fixed effect. We assume that $\rho_i = \rho$, for every i. Hence, to test for stationarity in level, we test $H_{o:}\ \rho = 1$ against the alternative hypotheses $H_{1:}\ \rho < 1$.

Consistent with Equations 1 through 4, the econometric models for cross-section i in time t is specified as follows. The log functional form *(L)* was used to specify the four equations except for interest rates (INT) and exchange rates (EXRATE).

(6) $LFDI_{i,t} = \alpha_i + \delta_1 LXPRICE_{i,t} + \delta_2 LWAGES_{i,t} + \delta_3 INT_{i,t} + \delta_4 LGNP_{i,t} + \delta_5 LPSE_{i,t} + \delta_6 LSALES_{i,t} + \delta_7 LTAX_{i,t} + \delta_8 DUMCRISIS_t + \delta_9 EXRATE_{i,t} + \mu_{i,t}$

(7) $LSALES_{i,t} = \alpha_i + \lambda_1 LXPRICE_{i,t} + \lambda_2 LWAGES_{i,t} + \lambda_3 INT_{i,t} + \lambda_4 LGNP_{i,t} + \lambda_5 LPSE_{i,t} + \lambda_6 EXRATE_{i,t} + \lambda_7 LTAX_{i,t} + \lambda_8 DUMCRISIS_t + \mu_{i,t}$

(8) $LXQUANT_{i,t} = \alpha_i + \beta_1 LXPRICE_{i,t} + \beta_2 LWAGES_{i,t} + \beta_3 INT_{i,t} + \beta_4 LGNP_{i,t} + \beta_5 LPSE_{i,t} + \beta_6 EXRATE_{i,t} + \beta_7 LTAX_{i,t} + \beta_8 DUMCRISIS_t + \mu_{i,t}$

(9) $LEMPLOY_{i,t} = \alpha_i + \rho_1 LXPRICE_{i,t} + \rho_2 LWAGES_{i,t} + \rho_3 INT_{i,t} + \rho_4 LGNP_{i,t} + \rho_5 LPSE_{i,t} + \rho_6 LSALES_{i,t} + \rho_7 LTAX_{i,t} + \rho_8 DUMCRISIS_t + \delta_9 EXRATE_{i,t} + \mu_{i,t}$

The relationship between FDI and export prices has been subject to debate, but either relationship between FDI and exports price are – complementarity or substitutability – could hold. Many studies suggests the latter (e.g., Gopinath et al. 1999; Brincogne and Forero, 2013; and Fung et al. 2013),

so δ_1 is expected to be negative. Related, the relationships between export price and sales by foreign affiliate, export quantity, and employment by foreign affiliate, as represented by λ_1, β_1, and ρ_1 are expected to be positive, negative and positive, respectively.

In classical theory of production, wage is inversely related to production through labor. As such, an increase in wage in the host country may lead to a decrease in FDI inflow, a decrease in sales (provided wage increases affect prices and products are normal goods), an increase in exports to the host country (as foreign products may become relatively cheaper), and a fall in employment by the affiliate. In order words, δ_2, λ_2 and ρ_2 are expected to be negatively signed, while β_2 is expected to be positively signed.

In broad terms, the interest rate is the return on risk-free investment. Typically, it is negatively associated with risky investment (Love and Lage-Hidalgo, 2000; and Erdal and Tatoglu, 2002). Consequently, δ_3 is expected to be negatively signed. Because the relationships between the interest rate and sales, and interest rates and exports are unclear, the expected signs for λ_3, and β_3 are either positive or negative. Given that the interest rate also represents the cost of investment, a lower interest rate would imply more investment and more employment. Thus, ρ_3 is expected to be negative.

In theory, FDI and the host country's economic growth are positively related. However, empirical evidence concerning this relationship is inconclusive. Borensztein et al. (1998) suggest that FDI and growth are positively related if a country achieves a certain human capital threshold. Conversely, Alfaro, (2003) argues the relationship depends on which sector's FDI is being considered. The primary (agricultural) sector, for example, seems to have a negative association with growth. Therefore, the expected sign for δ_4 is unclear. Because economic growth almost always goes in tandem with more sales and increased demand for labor, λ_4 and ρ_4 are expected to be positive. However, β_4 may be positive or negative depending on how much impact growth has on the exchange rate.

Based on the work by Gopinath et al. (1999), δ_5 and λ_5 are expected to be negative while β_5 and ρ_5 are expected to be positive. Also, δ_6 and ρ_6 are expected to be positive. Exchange rates may affect domestic sales depending on how much it makes foreign alternatives cheaper or more expensive, so λ_6 is expected to be positive while β_6 is expected to be negative.

Since taxes typically add to the cost of production, their effects are expected to be similar to those on wages. Thus δ_7, λ_7 and ρ_7 are expected to be negatively signed while β_7 is expected to be positive. The financial crisis from 2007 through 2010 had a global effect. At that time, several sectors of most developed countries experienced a downturn. Consequently, the coefficient for DUMCRISIS is expected to be negative in all four equations.

Findings and Discussion Table 1 presents the unit root result for all variables employed in the analysis. For most of the variables, the null hypothesis that the coefficient of the lagged dependent variable is equal to 1 is rejected, so all but *LPSE* are stationary. This implies that they revert back to their long run mean. In other words, a rise is more likely to follow a fall, and a fall is more likely to follow a rise.

Although correlation does not necessarily imply causality, it does suggest a need to examine the possible causal relationships and the dynamics thereof (see Table 2). Across the panel of countries, agricultural FDI has the strongest positive correlation with affiliate sales and employment (82% and 80%, respectively). Conversely, it has mildly negative correlations with GNP, wages, exchange rate and interest rates (of 13%, 30%, 4% and 11%, respectively).

Table 2 further shows that employment by majority-owned foreign affiliates is highly correlated with sales (86%) and wages (-0.57). The directions of the correlations are also intuitive as one would expect more demand (sales) to boost employment while higher wages impedes it. In addition to FDI and employment by affiliates, sales by affiliates shows a strong positive correlation with net tax (with a correlation coefficient of 45%). Interestingly, export quantity appears to be strongly and positively

correlated with export price. This belies fundamental theory of demand which predicts that as export prices increase, exports become less competitive abroad, so this would result in a decrease in the quantity exported. Although far from being conclusive, these preliminary correlation results highlight the need for further investigation using more robust econometrics tools.

Table 3 through 6 present the coefficient estimates for Equations 6 through 9. Based on the test for cross-section random effects (i.e. the Hausman test), a random panel regression is appropriate for equations 6 through 9 (see χ^2 Statistic in tables 3 through 6). Table 3 presents the estimates for equation 6 with dependent variable *LFDI*. The results show that a 1% increase in the export price is associated with an increase of about 0.26% in the FDI position abroad for the food processing industry, other things held constant. This result is statistically significant at the 1% significant level. The direction of association is intuitive and as expected, because an increase in price of export from the U.S would make exports relatively more expensive, and lead to a surge in demand for local alternatives. Similarly, a percentage rise in Producer Support Estimates, sales by affiliates, taxes or a unit increase in the exchange rate is associated with a 0.04%, 0.56% 0.26% and 0.010% increase in *LFDI,* respectively, across the panel, ceteris paribus. The coefficients of sales and tax are significant at the 1% level, while *LPSE* and *EXRATE* are significant at 5%. These outcomes are also intuitive. Generally, subsidies aid to increase industry competitiveness by defraying some of the cost of production. Thus, it only makes sense that it improves the U.S. FDI position across the panel. This is exactly the same estimate found by Gopinath et al. (1999), although their estimate were not statistically significant. Since the *EXRATE* is denominated in US$, a rise will imply that U.S. produce becomes more expensive for the affiliate countries. Thus, just like the impact of the export price, countries hosting the foreign affiliates would substitute U.S. products with local alternatives.

Conversely, a percentage change in wages or gross national product or a unit change in the interest rate is associated with a 0.61%, 1.01% and 0.02% decline in *LFDI* across the panel, respectively.

Gopinath et al. (1999) found the same direction of association for wages and interest rates, but they found a positive but minuscule association between *LFDI* and *LGNP.* The financial crisis does not seem to alter these associations, as the dummy variable *DUMCRISIS* is not statistically significant even at the 10% level. The value of the adjusted R-square implies that about 80% of the variation in *LFDI* is explained by the model.

Table 4 presents the parameter estimates for the foreign affiliate sale equation. The results show that a percentage increase in export price, gross national product, subsidies, tax or a unit rise in exchange rate is associated with an increase in foreign affiliate sales by 0.35%, 1.67%, 0.02%, 0.65% and 0.01% across the panel, respectively. The relationship between sales and export price suggests and bolsters the existence of the substitution effect previously discussed. A rise in the export price makes domestic alternatives relatively cheaper and consequently creates a surge in demand for local produce, ceteris paribus. A unit change in the interest rate and a percentage in wages are negatively associated with a 0.01 units and 1.50% decline in sales, respectively. All these parameter estimates are significant at 1% level, except LPSE, which is significant at the 5% level and INT. The financial crisis of 2007 through 2010 impacted sales by foreign affiliates. The value of the adjusted R-squared implies that about 48% of the variation in sales across the panel is explained by the model.

Table 5 presents the results for the export equation. The results indicates that a one percentage increase in the export price is associated with a 1.05% increase in the amount exported. This implies that U.S. agricultural exports exhibit an abnormal demand curve. A unit increase in the interest rate and exchange rate, or a percentage increase in *LGNP*, *LPSE* and *LTAX* is associated with a 0.01% and 0.004% and 1.07%, 0.03% and 0.06% fall in export, respectively. The financial crisis dummy does not appear to affect agricultural export to the U.S. affiliate nations studied. The model explains about 96% of the variation in U.S. agricultural export for the panel of countries studied.

Table 6 contains the results for the affiliate employment equation. A percentage change in the wage rate, GNP per capita, and a unit increase in the exchange rate are associated with a 0.82%, 0.99% and 0.004% decline in employment, respectively. Conversely, a percentage increase in sales by foreign affiliates or subsidies equivalent is associated with a 0.89% and 0.04% increase in employment, respectively. The model explains about 95% of the variation in affiliate employment.

Results indicate that U.S. exports and affiliate sales due to outward FDI increased over the period of analysis, but sales by foreign affiliates far exceeded exports. Also, results show that U.S. exports and FDI are complements, in the sense that exports have a positive effect on FDI and, vice versa, FDI has a positive effect on exports. Furthermore, a nation's GNP per capita was found to be an important factor in determining sales by foreign affiliates. Finally, the results suggest that owners of capital in the processed food industry stand to gain more than the workforce because the former disproportionately benefit from their returns on investment in the long run.

Our findings largely differ from those of previous studies, which may be explained as follows. First, we consider data over a longer and different period of time compared to previous studies such as Gopinath et al. (1999). Second, our study accounts for random cross-sectional and period effects that are common in heterogeneous panel studies, unlike previous studies which implicitly assume that the top-ten U.S. affiliates are homogeneous across time. While our results should be interpreted with caution because we employed selected proxies for actual data, they provide an important contribution to the literature on the determinants of trade and FDI in the processed food sector, and whether the two serve as complements or substitutes for one another.

Conclusions This study attempts to gain insight on U.S. foreign direct investment and exports in the processed food industry. We extend earlier studies, and estimate an econometric model to determine the factors affecting U.S. processed food exports and sales by affiliates in ten developed countries. We

also assessed the relationship between U.S. exports and FDI and examined whether FDI serves as a substitute or complement to foreign trade. Results indicate that U.S. exports and affiliate sales (due to outward FDI) have both been increasing but sales by foreign affiliates far exceed exports. Also, results show that U.S. exports and FDI are complements, in the sense that exports have a positive effect on FDI and vice versa, FDI has a positive effect on exports. Furthermore, a nation's GNP per capita was found to be an important factor in determining sales by foreign affiliates. Finally, the results suggest that owners of capital in the processed food industry stand to gain more than the workforce because the former disproportionately benefit from their returns on investment in the long run.

The discrepancies between our findings and those of the previous studies could stem from one or more reasons. First, we consider data over a longer and different period of time compared to previous studies like the study by Gopinath et al. (1999). Second, unlike previous studies, this study accounts for random cross sectional and period effects that are common in heterogeneous panel studies. Although not explicitly stated, studies like those by Gopinath et al (1999) implicitly assume that the top ten U.S. affiliates are homogeneous across time. However, our results should be interpreted with caution because several proxies for actual data were employed.

The results show that *LFDI* falls as a result of an increase in GNP per capita, which in turn positively impacts sales by foreign affiliates. This dilemma may require further investigation. Also, although the parameter estimates and their signs of *LWAGE, LPSE, EXRATE* and *LSALES* are intuitive and expected, the rationale behind a rise in GNP being associated with a decline in employment is hard to justify and requires further investigation. Also, future research may focus on modelling both outward and inward FDI, which may further help in understanding the determinants of FDI and trade and the relationship between the two.

Table 1. Unit root test from panel regression.

	LXPRICE	LWAGE	INT	LGNP	LPSE	EXRATE	LTAX
LXPRICE (-1)	1.01***						
	(0.00)						
LWAGE (-1)		1.00***					
		(0.00)					
INT (-1)			0.96***				
			(0.00)				
LGNP (-1)				1.00***			
				(0.00)			
LPSE (-1)					0.99***		
					(0.00)		
EXRATE (-1)						0.91***	
						(0.00)	
LTAX (-1)							0.98***
							(0.00)
H0:a1=1	6.75***	4.83***	-2.49**	13.54***	-0.34	-5.64***	-2.12**

Notes*:* the values parentheses are the *p* values. *, ** and *** imply significance at 10%, 5% and 1% level, respectively. H0:a1= 1 is the Wald test statistic values on the lagged dependent variable equal one.

Table 2. Panel pairwise correlation between the variables.

	LFDI	*LEMPLOY*	*LGNP*	*LPSE*	*LSALES*	*LTAX*	*LWAGE*	*LXPRICE*	*LXQUANT*	*EXRATE*
LFDI	1.00									

LEMPLOY	0.80***	1.00								
	(0.00)	-----								
LGNP	-0.13	-0.29***	1.00							
	(0.17)	(0.00)	-----							
LPSE	0.21**	0.33***	-0.26***	1.00						
	(0.02)	(0.00)	(0.00)	-----						
LSALES	0.82***	0.86***	0.091	0.09	1.00					
	(0.00)	(0.00)	(0.31)	(0.33)	-----					
LTAX	0.40***	0.34***	-0.01	-0.15*	0.45***	1.00				
	(0.00)	(0.00)	(0.92)	(0.09)	(0.00)	-----				
LWAGE	-0.30***	-0.57***	0.60***	-0.47***	-0.15 *	0.09	1.00			
	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.34)	-----			
LXPRICE	0.29***	0.06	0.27***	-0.02	0.18**	-0.32***	0.22**	1.00		
	(0.00)	(0.54)	(0.00)	(0.84)	(0.04)	(0.00)	(0.01)	-----		
LXQUANT	0.25**	0.05	0.17*	-0.03	0.14	-0.36***	0.16*	0.98***	1.00	
	(0.01)	(0.58)	(0.06)	(0.75)	(0.12)	(0.00)	(0.07)	(0.00)	-----	
EXRATE	-0.04	-0.21**	0.31***	-0.30***	0.08	0.47***	0.55***	-0.31***	-0.38***	1.00
	(0.68)	(0.02)	(0.00)	(0.00)	(0.35)	(0.00)	(0.00)	(0.00)	(0.00)	-----
INT	-0.11	0.12	-0.40***	0.27***	-0.09	0.07	-0.31***	-0.36***	-0.34***	-0.18*
	(0.24)	(0.17)	(0.00)	(0.00)	(0.33)	(0.42)	(0.00)	(0.00)	(0.00)	(0.05)

Notes: the values in parentheses are the p values. *, ** and *** imply significant at 10%, 5% and 1% level, respectively.

Table 3. Parameter Estimates for FDI Demand Equation (*equ*. 6)

Variables	Parameter estimate	T-statistics
LXPRICE	0.25***	(6.10)
LWAGE	-0.61***	(-3.62)
INT	-0.02*	(-1.94)
LGNP	-1.07***	(-2.92)
LPSE	0.04**	(2.01)
LSALES	0.56***	(10.26)
LTAX	0.25***	(4.09)
DUMCRISES	-0.03	(-0.49)
EXRATE	0.01**	(1.95)
CONSTANT	4.06**	(2.69)
Adjusted R-squared	0.79	
Chi-Square (χ^2) Statistic	23.30***	

Notes: The values parentheses contain the t-statistics.
*, ** and *** indicate significant at the10%, 5% and 1% levels, respectively.

Table 4. Parameter Estimates for Foreign Affiliate Sales (e*qu.* 7)

Variables	Parameter estimate	T-statistics
LXPRICE	0.35***	(12.47)
LWAGE	-1.40***	(-11.78)
INT	-0.01	(-1.25)
LGNP	1.67***	(7.39)
LPSE	0.03**	(2.27)
EXRATE	0.01***	(4.81)
LTAX	0.65***	(16.37)
DUMCRISES	-0.01	(-0.16)
CONSTANT	-7.19***	(-7.30)
Adjusted R-squared	0.43	
Chi-Square (χ^2) Statistic	422.32 ***	

Notes: The values parentheses contain the t-statistics.
*, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Table 5. Parameter Estimates for Export (XI) *(equ*. 8)

Variables	Parameter estimate	T-statistics
LXPRICE	1.05***	(45.83)
LWAGE	0.07	(0.92)
INT	-0.01	(-1.47)
LGNP	-1.04***	(-5.54)
LPSE	-0.03***	(-2.89)
EXRATE	-0.004**	(-2.24)
LTAX	-0.06*	(-2.01)
DUMCRISES	-0.03	(-0.66)
CONSTANT	4.88***	(5.58)
Adjusted R-squared	0.96	
Chi-Square (χ^2) Statistic	28.04***	

Notes: The value in parentheses contain the t-statistics.

*, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Table 6: Parameter Estimates for Affiliate Employment (*equ.* 9)

Variables	Parameter estimate	T-statistics
LXPRICE	0.01	(0.06)
LWAGE	-0.82***	(-9.45)
INT	0.01	(1.12)
LGNP	-0.99***	(-6.08)
LPSE	0.04***	(3.81)
LSALES	0.89***	(35.28)
LTAX	0.75	(2.45)
DUMCRISES	-0.06*	(-2.29)
EXTRATE	-0.004***	(-2.68)
CONSTANT	5.37***	(7.32)
Adjusted R-squared	0.95	
Chi-Square (χ^2) Statistic	90.67***	

Notes: The values in parentheses contain the t-statistics.

*, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

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